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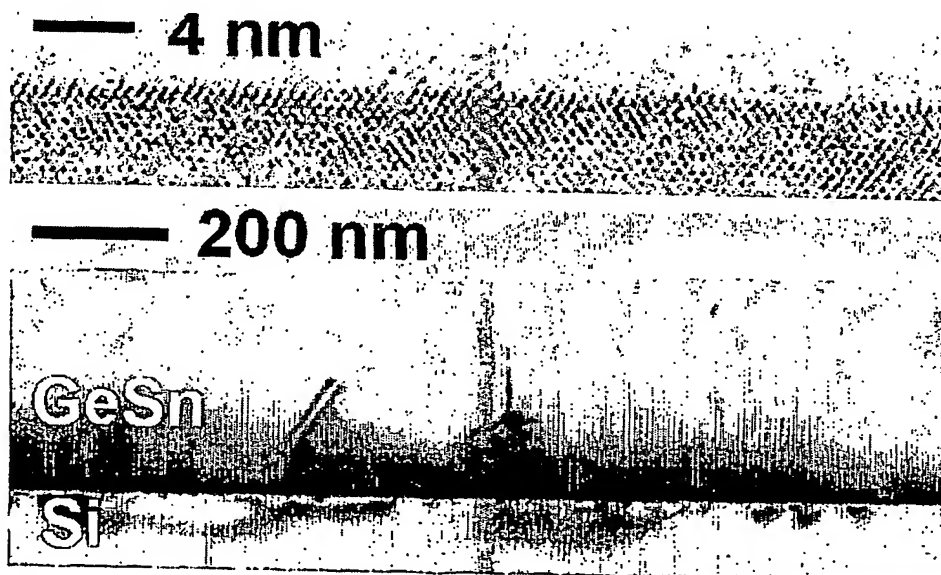
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(54) Title: **GESN ALLOYS AND ORDERED PHASES WITH DIRECT TUNABLE BANDGAPS GROWN DIRECTLY ON SIL-  
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(57) Abstract: A method for depositing an epitaxial Ge-Sn layer on a substrate in a CVD reaction chamber includes introducing into the chamber a gaseous precursor comprising SnD<sub>4</sub> under conditions whereby the epitaxial Ge-Sn layer is formed on the substrate. the gaseous precursor comprises SnD<sub>4</sub> and high purity H<sub>2</sub> of about 15-20 % by volume. The gaseous precursor is introduced at a temperature in a range of about 250 °C to about 350 °C. Using the process device-quality Sn-Ge materials with tunable bandgaps can be grown directly on Si substrates.

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